



Focus on SILICA

Worker Exposure Assessment and the Tools You Need

Respirable crystalline silica (RCS) exposure occurs in industries including construction, mining, quarrying, foundry work, concrete production, sandblasting, hydraulic fracturing, stone cutting/grinding, and abrasive blasting.

To better protect workers in construction and general industry, OSHA put into effect a Final Silica Rule in 2016. MSHA published its Final Silica Rule on April 18, 2024 to reduce miner exposure to RCS. These regulations provide for an RCS permissible exposure limit (PEL) of 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) for a full shift (calculated as an 8-hour time-weighted average or TWA) and establish an Action Level for RCS at 25 $\mu\text{g}/\text{m}^3$ for a full shift (calculated as an 8-hour time TWA). Both OSHA and MSHA rules require employers to evaluate the exposure of each employee who is, or could reasonably be expected to be, exposed to RCS. Assessment options are spelled out in each regulation. Visit <https://bit.ly/3UhJA8C> for the OSHA Final Silica Rule and <https://bit.ly/3Q6j4fl> for the MSHA Silica Rule.

Both OSHA and MSHA Final Silica Rules allow exposure monitoring with respirable dust samplers that conform to ISO 7708/CEN criteria. SKC respirable dust samplers that meet the ISO 7708/CEN criteria and that are listed in both the OSHA and the MSHA Final Silica Rules and other regulations are described in this brochure. **If your focus is on silica, SKC can help with our easy-to-use air sampling tools for compliance silica sampling.**

See inside for respirable dust samplers that meet the criteria in the OSHA and MSHA Final Silica Rules.



**The Leader in Sampling Solutions and
Expertise for OEHS Professionals**

www.skinc.com

SKC Respirable Dust Cyclones

Listed in OSHA and MSHA Silica Rules

SKC offers two respirable dust cyclones to meet the performance criteria in the OSHA Final Silica Rule¹ (pages 16439, 16441, and 16453). The Aluminum Cyclone is listed in the MSHA Silica Rule² (search "Aluminum Cyclone"). Both cyclones are designed for superior performance compared to other cyclones on the market.



SKC Aluminum Cyclone meets ISO 7708/CEN criteria at a flow rate of 2.5 L/min. See performance data relative to the ISO/CEN standard adopted by OSHA, MSHA, ACGIH, and other international agencies in Reference 3 at bottom left.



SKC GS-3 Cyclone meets ISO 7708/CEN criteria at a flow rate of 2.75 L/min. See performance data relative to the ISO/CEN criteria in Reference 4 at bottom left.

Respirable Dust Cyclone Features/Advantages

- Conductive plastic or aluminum construction eliminates electrostatic effects
- Used with an open-face 3-piece cassette for even particle deposition on the filter
- Available in 25 or 37 mm
- Aluminum Cyclone has an easy-to-use calibration adapter accessory
- GS-3 Cyclone features three inlet slits that eliminate the ambient wind speed and orientation bias found with the 10-mm nylon cyclone

Ordering

Sampler		Cat. No.
Aluminum Cyclone with grit pot, <i>requires a 3-piece cassette</i>	25 mm	225-01-01
	37 mm	225-01-02
GS-3 Cyclone with bowl adapter, cassette adapter, and grit pot, <i>requires a 3-piece cassette</i>	25 mm	225-103
	37 mm	225-100

Sampling Media - 37 mm (see www.skcinco.com for 25 mm)		Cat. No.
PVC Filters, GLA-5000, 37 mm, 5.0-µm pore size, with supports	pk/100	225-5-37-P
SureSeal Cassette Blanks, 37 mm, 3 pieces, clear styrene; <i>require SureSeal Cassette Opener accessory</i>	pk/50	225-3050LF
Preloaded PVC Filters, GLA-5000, 37 mm, 5.0-µm pore size with supports, in 3-piece clear styrene cassette, banded; <i>require SureSeal Cassette Opener accessory</i>	pk/50	225-803
Prewieghed PVC Filters in Cassettes, GLA-5000, 37 mm, 5.0-µm pore size filter with supports, preweighed, 5 decimal; in a 3-piece clear styrene cassette, banded	pk/10 pk/50	225-8208A 225-8209A

Accessories		Cat. No.
Calibration Adapter for Aluminum Cyclone, 25/37 mm		225-01-03
Standard Calibration Jar for GS-3 Cyclone, 25/37mm		225-111
Filter Cassette/Cyclone Holder, 25/37 mm		225-1
SureSeal Cassette Opener, 25/37 mm		225-13-5B

Visit www.skcinco.com for more information.

PERFORMANCE PROFILE

Flow Rate:

Aluminum Cyclone: 2.5 L/min

GS-3 Cyclone: 2.75 L/min

Sampling Media:

Requires a 25 or 37-mm, 3-piece cassette loaded with 5.0-µm PVC filter

Recommended Sampling Pumps/Flowmeter:

AirChek Touch Series Pumps

chek-mate Medium Flow Flowmeter

See pages 6 and 7.

References

¹ OSHA Final Silica Rule, 29 CFR 1926.1153, 81 FR 16875-16882, March 25, 2016; 84 FR 21597, May 14, 2019, <https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.1153>

² Dept. of Labor Mine Safety and Health Administration 30 CFR Parts 56, 57, 60, 70, 71, 72, 75, and 90, Docket No. MSHA-2023-0001] RIN 1219-AB36 MSHA Silica Rule: Lowering Miners' Exposure to Respirable Crystalline Silica and Improving Respiratory Protection, <https://bit.ly/3Q6j4fl>

³ Harper, M., et al., "Calibration of the SKC, Inc. Aluminum Cyclone ..." Jnl. of Aer. Sci., Vol. 29, (Suppl. 1), 1998, pp. S347-S348, <https://doi.org/b958xd>



⁴ Gautam, M. and Sreenath, A., "Performance of a Respirable Multi-inlet Cyclone," Jnl. of Aer. Sci., Vol. 28, No. 7, 1997, pp. 1265-1281 (<https://doi.org/1hsgz>)

SM-7204 Personal Silica Monitor

Concurrent Real-time Read-out and Sampling

- Adjustable pump compensates flow for changes in back pressure, temperature, and atmospheric pressure
- Accepts preloaded 37-mm or 25-mm filter cassettes
- Compatible with ISO validated sampling inlets
- Sensor/filter cassette clips directly in the breathing zone
- Easy-to-clean optical sensor
- Displays real-time graphing and measurements in $\mu\text{g}/\text{m}^3$ or mg/m^3
- On-screen programming of libraries for aerosol profiles and data set naming
- Comes standard with GS-3 Cyclone; available with SKC PPI inlet/sensor (both conform to ISO 7708/CEN criteria)
- Infield PM calibration and verification
- Concurrent filter sampling option for lab analysis and/or cross-calibration of displayed results
 - Gravimetric filter cassette located directly behind the sensor for maximum particle deposition
- Datalogging
 - DustComm Software for downloading, trend analysis, and graphical analysis/comprehensive reporting

The new SM-7204 is optimized for measuring silica levels specified in the OSHA and MSHA Final Silica Rules and calibrated to a known amount of silica dust. Use direct readings for determination of peak silica concentrations for mitigation and lower TWAs. SM-7204 alerts users to approaching thresholds for immediate corrective action. Quickly implement controls and measure effectiveness to reduce further silica exposures. SM-7204 features a built-in compensating pump and gravimetric filter cassette directly behind the sensor to provide for concurrent gravimetric sampling for silica analysis and cross-calibration.

Description	Cat. No.	Qty.
SM-7204 Silica Monitor Kit includes monitor with battery, 37-mm opaque filter cassette, open-faced sampling adapter, GS-3 respirable cyclone, flow adapter, micro USB download cable, universal battery charger, zeroing accessory, USB with DustComm Pro Software and manual, and certificate of calibration, in a hard carry case  110-240 V	770-700A	ea
SM-7204 Silica Monitor Kit with PPI Inlet/Sensor , includes monitor with battery, PPI (without filter), micro USB download cable, universal battery charger, and DustComm Pro Software and manual, in a hard carry case  110-240 V	770-700P	ea

 Requires calibration with equipment sold separately; see Accessories.

Accessories and Replacement Parts		
Infield Calibration Verification	770-327	ea
Calibration Jar , for calibrating and setting pump flow when using a respirable cyclone	225-112	ea
Replacement Zeroing Filter	770-7209	ea
Replacement Battery Pack, Li-Ion	770-7205	ea
PPI Sensor with Factory Calibration for Preexisting 7204 Models , preexisting unit must be returned for factory calibration when purchasing this item	770-7215	ea

Visit www.skcinco.com/products/sm-7204-personal-silica-monitor for more information.



SM-7204 is uniquely optimized for silica exposure measurement at the new PEL.

APPLICATIONS

- Monitoring regulated areas with user-set alarms
- Evaluation of controls/worker activities
- Recording time history of dust levels
- Filter sampling for lab analysis
- Task monitoring
- Selecting PPE

PERFORMANCE PROFILE

Sensor: Light scattering

Flow Rate: 1 to 5 L/min, user selectable

Sensing Range: 0.001 to 500 mg/m^3
(1 to 500,000 $\mu\text{g}/\text{m}^3$)

Measuring Range: Particle sizes from 0.1 to 100 μm

Precision: $\pm 0.002 \text{ mg}/\text{m}^3$ or $2 \mu\text{g}/\text{m}^3$

Accuracy: $\pm 10\%$ to filter gravimetric SAE fine test dust

Calibration: ISO 12103-1 A2 fine test dust component with total silica, crystalline analysis of dust by X-ray diffraction - NIOSH 7500 and dust analyses gravimetric - NIOSH 7500.

Display: Concentration in mg/m^3 or $\mu\text{g}/\text{m}^3$, sampling size fraction of PM (OSHA TWA, AVG, MAX, MIN), start and stop time, elapsed run time, log rate, flow, real-time rolling graphs, personalized named data sets, unique aerosol profiles, language options, battery life, pump faults, infield calibration test, history of data sets

Gravimetric Filter Sampling Requirement: 37-mm PVC filter for supplied 37-mm in-line cassette (25-mm filter and cassette options are available)

Parallel Particle Impactors (PPIs) Listed in the OSHA and MSHA Silica Rules

- Collection efficiency precisely matches ISO 7708/CEN criteria adopted in the OSHA Final Silica Rule, MSHA Final Silica Rule, NIOSH respirable dust methods, and other regulations
- Available in three flow rates for your applications
 - 2 and 4 L/min models for TWA sampling
 - 4 and 8 L/min model for shorter-term sampling
- Disposable anti-static plastic, designed for one-time use — no cleaning required
- Disposable PPI® Sampler Options
 - **Preloaded** with filter and pre-oiled impaction substrates by SKC
 - **Preloaded, preweighed** filter and pre-oiled impaction substrates by SKC
 - **Empty** except for pre-oiled impaction substrates, ready for lab or user to load filter
- The proof is in the performance
 - Published in the Journal of Physics—see reference at bottom left.
 - Referenced in the OSHA Final Silica Rule
 - Rutgers evaluation of PPI performance—visit www.skinc.com/report-rutgers-07-14-2020-ppi
- PPI Samplers are available in reusable aluminum; see more at www.skinc.com/ppi-sampler

PERFORMANCE PROFILE

Flow Rate: 2, 4, or 8 L/min; model dependent; meet ISO 7708 criteria in OSHA Final Silica Rule† and MSHA Final Silica Rule

Sampling Media: 37-mm PVC filter/support

Recommended Sampling Pumps/Flowmeters:

AirChek Touch Series Pumps:

For 2 and 4 L/min; see more on pages 6 and 7

Leland Legacy Pump:

For 8 L/min; see more at www.skinc.com/categories/air-sampling-pumps-to-30-l-min

chek-mate Flowmeters:

Medium Flow or High Flow (sampler flow rate dependent); see more at www.skinc.com/chek-mate

† PPI performance data from a peer-reviewed journal article and part of the OSHA docket in OSHA Final Silica Rule development

References

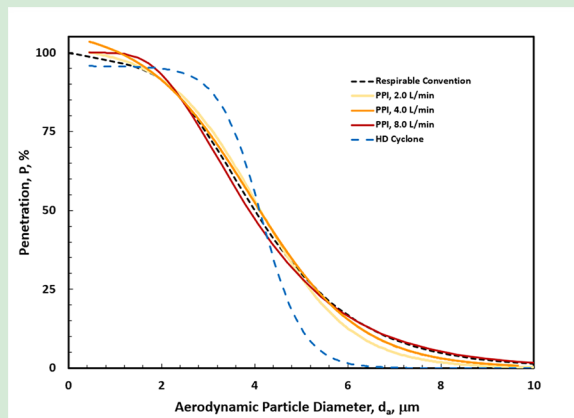
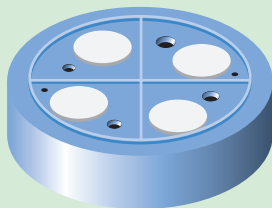
Trakumas, S. and Salter, E., "Parallel Particle Impactor – Novel Size-selective Particle Sampler for Accurate Fractioning of Inhalable Particles," *Journal of Physics: Conference Series*, 151: 012060, <http://doi.org/fbcwkw>

OSHA Final Silica Rule: <https://bit.ly/3UhuA8C>

MSHA Final Silica Rule: <https://bit.ly/3Q6j4fi>, search "PPI sampler"

A Closer Match to the Entire ISO 7708/CEN Curve with PPI

With its four-impactors-in-parallel design, the PPI Sampler provides the most precise match to the entire ISO 7708/CEN curve to meet the requirements of the OSHA and MSHA Final Silica Rules and other regulations.



Parallel Particle Impactors (PPIs)

Disposable — Convenient for Professionals and Labs

Preloaded Disposable Plastic PPI Samplers

Description	Cat. No.	Qty.
Preloaded Disposable PPI Samplers* contain four porous plastic disc impaction substrates, one 37-mm cellulose support, and one collection filter as noted		
Respirable PPI (red) , 8 L/min, plastic, with 5.0-µm PVC filter	225-3841	ea
Respirable PPI (orange) , 4 L/min, plastic, with 5.0-µm PVC filter	225-3871	ea
Respirable PPI (gold) , 2 L/min, plastic, with 5.0-µm PVC filter	225-3851	ea
	225-3851B	50
Respirable PPI (gold) , 2 L/min, plastic with 1.0-µm PTFE filter, no support	225-3852	ea
With Prewieghed Filter		
Respirable PPI (red) , 8 L/min, plastic, 5.0-µm PVC filter preweighed to 5 decimals; unit supplied in tamper-evident inner bag	225-3841-PW	ea
Respirable PPI (orange) , 4 L/min, plastic, 5.0-µm PVC filter preweighed to 5 decimals unit supplied in tamper-evident inner bag	225-3871-PW	ea
Respirable PPI (gold) , 2 L/min, plastic, 5.0-µm PVC filter preweighed to 5 decimals; unit supplied in tamper-evident inner bag	225-3851-PW	ea
	225-3851C-PW	100

*Designed for one-time use

User-loaded Disposable Plastic PPI Samplers

Description	Cat. No.	Qty.
User-loaded Disposable PPI Samplers* contain four porous plastic disc impaction substrates, <i>require collection filter and support; see information below and select based on application</i>		
Respirable PPI (red) , 8 L/min, plastic	225-384	ea
Respirable PPI (orange) , 4 L/min, plastic	225-387	ea
	225-387A	25
Respirable PPI (gold) , 2 L/min, plastic	225-385	ea
	225-385A	25

*Designed for one-time use

Filters for User-loaded PPI Samplers	Cat. No.	Qty.
PVC Filters , 37 mm, 5.0-µm pore size	225-5-37	100
MCE Filters , 37 mm, 0.8-µm pore size	225-1939	100

Filter Supports for User-loaded PPI Samplers	Cat. No.	Qty.
Support Pads , cellulose, 37 mm	225-27	100
Stainless Steel Screen , 37 mm, wide mesh	225-26	ea

Accessory	Cat. No.	Qty.
Calibration Adapter , for Disposable PPI Samplers only	225-389	ea

Visit www.skccinc.com/ppi-sampler for more information.



PPI Advantages

- **Convenient calibration adapter** — no calibration jar needed!



- **No tipping hazard!**
PPI can be inverted without causing large particles to invalidate the filter sample.





SKC AirChek Sample Pumps

Touch Technology Enhanced, Constant Flows 5 to 5000 ml/min

Flows from 5 to 5000 ml/min

- Automatic constant flows maintained within $\pm 5\%$
- 5 to 500 ml/min with low flow holder
- Multi-tube sampling in low flow mode

High back pressure compensation

- Up to 50 inches water at 2 L/min

Long run times on Li-Ion battery

Correct flow for changes in temperature and atmospheric pressure

Flow fault with auto-restart

Intuitive touch operation

Bright running and status LEDs

Tough no-slip case

Ultra-quiet – average 51.7 dB

(37-mm, 0.8- μ m MCE filter at 2 L/min)

Small and lightweight

- 4.1 x 3.7 x 2.8 inches (10.4 x 9.4 x 7.1 cm)
- 19.4 ounces (550 grams)

Screen protection and security

- Protective screen cover
- Screen lock-out feature

Designed to meet ISO 13137:2022



Choose SKC AirChek® Touch Series sample pumps for your applications. AirChek Essential+ offers the simplest operation and best value with enhanced touch screen and lowest price. Feature-rich AirChek TOUCH provides full programmability from PC or full-color touch screen and automatic flow rate verification/calibration with CalChek. AirChek Connect features Bluetooth connectivity to mobile devices and PC for easy remote monitoring without interrupting workflow. AirChek Touch Series sample pumps are built to serve you and the workers you protect.

AirChek **ESSENTIAL+** AirChek **TOUCH** AirChek **CONNECT**

AirChek	Low Price Simple Operation	Fully Programmable Easy Navigation	Bluetooth-connectivity Mobile App
Operation	Touch screen	Color touch screen	Touch screen
Display	High-contrast backlit B&W LCD, battery status, and elapsed run time	Color LCD, time, date, battery status, real-time flow rate, sample volume, ambient temperature, atm. pressure, fault, accumulated volume, elapsed time, pump run and stop status	High contrast backlit B&W LCD, time, date, battery status, flow rate, fault, sample volume, temp, atm. pressure, back pressure, programmed run remaining time, and elapsed run time
Programmable – Continuous, Timed, and Intermittent Sampling (presets available)		●	●
PC Compatible with DataTrac Pro Software – Download Sampling History		● [†]	●
Bluetooth Connectivity with PC and Mobile			● [‡]
Mobile App			●
Constant Pressure Mode			●
CalChek Hands-free Single-point Flow Rate Verification and Full Calibration with chek-mate Flowmeter		●	
Charging	Lite Cradle (charging, non-chainable) Standard Cradle (charging, chainable up to 5)	Standard Cradle (charging and CalChek connection, chainable up to 5) e-Cradle (charging, CalChek, and PC communication, chainable with Standard Cradles)	Standard Cradle (charging, chainable up to 5)
Certifications	Intrinsic safety: UL913, CAN/CSA C22.2, ATEX, IECEx, UKEX Other: CE, UKCA	Intrinsic safety: UL913, CAN/CSA C22.2 Other: CE, UKCA	Intrinsic safety: UL913, CAN/CSA C22.2, ATEX, IECEx, UKEX Other: CE, UKCA

[†] Connectivity to PC requires 877-93 or 220-900 (included in some kits) (see p. 7) [‡] Requires 877-94 to use Bluetooth with PC (included in some kits) (see p. 7)

AirChek ESSENTIAL+



On/Off-style Pump, Easy Touch Screen Operation, 5 to 5000 ml/min

AirChek Essential+ Pump Kits*	Cat. No.	
Starter Kit includes pump with battery, Lite Charging Cradle, Single Cradle Power Supply with cord, 3 feet (0.9 meter) of Tygon tubing, and collar clip with cable tie	100-240 V	220-3100-S
Single High Flow Pump Kit includes pump with battery, Lite Charging Cradle, Single Cradle Power Supply with cord, and filter cassette holder, in a soft-sided nylon carry case	100-240 V	220-3100-K
5-pack High Flow Pump Kit includes 5 pumps with batteries, 5 each: Lite Charging Cradles and filter cassette holders; and one Multi cradle Power Supply and Splitter with cord, in a hard-sided case	100-240 V	220-3100-K5

Contact your SKC representative for information on additional AirChek Essential+ Kits.

* AirChek Essential+ pumps contain Li-Ion batteries and are subject to special shipping regulations.

AirChek TOUCH



Fully Programmable, Full-color Touch Screen, 5 to 5000 ml/min

AirChek TOUCH Pump Kits**	Cat. No.	
Starter Kit includes pump with battery, Standard Charging Cradle, power supply with cord, 3 feet (0.9 meter) of Tygon tubing, and collar clip with cable tie, <i>connectivity to PC requires 877-93 below</i>	100-240 V	220-5000TC-S
Single High Flow Pump Kit includes pump with battery, Standard Charging Cradle, power supply with cord, and filter cassette holder, in a soft-sided nylon carry case, <i>connectivity to PC requires 877-93 below</i>	100-240 V	220-5000TC-K
5-pack High Flow Pump Kit includes 5 pumps with batteries, 4 Standard Charging Cradles, 1 e-Cradle, power supply with cord, USB cable for use with free DataTrac Pro software download, and 5 filter cassette holders, in a hard-sided case	100-240 V	220-5000TC-K5

* AirChek TOUCH pumps contain Li-Ion batteries and are subject to special shipping regulations.

CalChek capable pump; requires chek-mate Flowmeter, CalChek Communication Cable, and pulsation dampener (for full calibration)

AirChek CONNECT



Bluetooth Connectivity, Mobile App, 5 to 5000 ml/min

AirChek Connect Pump Kits*	Cat. No.	
Starter Kit includes pump with battery, Standard Charging Cradle, power supply with cord, 3 feet (0.9 meter) of Tygon tubing, and collar clip with cable tie, <i>requires 877-94 below to use Bluetooth with PC</i>	100-240 V	220-4000-S
Single High Flow Pump Kit includes pump with battery, Standard Charging Cradle, power supply with cord, and filter cassette holder, in a soft-sided nylon carry case, <i>requires 877-94 below to use Bluetooth with PC</i>	100-240 V	220-4000-K
5-pack High Flow Pump Kit includes 5 pumps with batteries and 5 each: Standard Charging Cradles and power supply with cord, and filter cassette holders; and 1 DataTrac Pro USB Bluetooth Adapter (software available via free download), in a hard-sided case	100-240 V	220-4000-K5

* AirChek Connect pumps contain Li-Ion batteries and are subject to special shipping regulations.

Accessories	Cat. No.	
Medium Flow chek-mate Flowmeter , 0.5 to 5 L/min, includes 9-volt battery and NIST standard traceable calibration certificate; also available with UK or ISO standard traceable calibration certificate. <i>Learn more at www.skcinco.com/chek-mate</i>		375-0550N
DataTrac Pro for AirChek TOUCH , includes e-Cradle, single power supply, and USB cable for connection to PC, <i>required for free software download and use of DataTrac Pro for AirChek TOUCH Software.</i>		877-93
DataTrac Pro for AirChek Connect , includes USB Bluetooth Adapter to be installed on USB port on PC, <i>required for free software download and use of DataTrac Pro Software for AirChek Connect.</i>		877-94

EXPERTISE

SKC Science Serving People through Training and Resources

Expertise is the foundation and heart of SKC solutions

SKC is dedicated to sharing its expertise to serve industrial hygiene and other OEHS professionals. Our goal is to help you protect the health and safety of people at work and in their communities.



Visit the SKC

KNOWLEDGECENTER

at www.skcinc.com

- **TECHNICAL** INFORMATION
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